

OGD-1503

POLICY AND PROCEDURES FOR MOLD PREVENTION AND ABATEMENT

A. Purpose/Introduction

The following procedures are to be implemented for the remediation/cleanup of mold and moisture, in the event of water infiltration into occupied spaces at National Institutes of Health (NIH) facilities, to protect the health of building occupants and mold remediators. These procedures are based on the Environmental Protection Agency (EPA) "Mold Remediation in Schools and Commercial Buildings", Document EPA 402-K-01-001 March 2001. This document is intended to be used mostly by facility managers and building managers.

B. Background

Mold is found almost everywhere and can grow on most organic materials if moisture and oxygen is present. Mold will grow on food, wood, carpet, paper and insulation. In locations and on materials where excessive moisture accumulates, mold will generally grow if the moisture remains undiscovered and/or uncorrected. Controlling the moisture in the building can minimize mold growth. When mold spores land on wet or damp areas indoors, they may begin to grow. Heat, especially moist heat that results from steam leaks, may accelerate mold growth. As the mold grows, it digests whatever it is growing on and gradually destroys it. Even if mold cannot be seen, its presence may be noticed by a mildew or earthy smell.

C. Health Effects

All molds have the potential to cause adverse health effects. Building occupants are to report any health concerns due to the environmental conditions in a facility to the Occupational Medical Service (OMS) in Building 10, Room 6C306, to be evaluated by a health practitioner.

D. Prevention

The most effective way to control mold is to solve moisture problems before mold growth starts. Mold prevention measures include:

- Fixing leaks as soon as possible.
- Be alert for condensation and wet spots. Moisture sources must be fixed as soon as possible.
- Prevent moisture caused by condensation by increasing surface temperature or reducing the humidity. Condensation results when surface temperature is below dew point temperature. Either increasing surface temperature or reducing humidity can prevent condensation.
 - To increase surface temperature, insulate or increase air circulation.
 - To reduce the moisture level in air, repair leaks, increase ventilation (if outside air is cold and dry), or dehumidify (if outdoor air is warm and humid).
- Keep HVAC drip pans clean, flowing properly, and unobstructed.
- Vent moisture-generating equipment to the outside, where possible.
- Maintain low indoor humidity, less than 60% RH, ideally 30-50%.

- Perform regular building/HVAC inspections and maintenance as scheduled.
- Clean and dry wet or damp spots within 48 hours.
- Don't allow building foundations to stay wet. Provide drainage and slope the ground away from the building foundation.

The above lists general guidelines. Results will depend on site conditions. Anyone considering a specific application should consult an expert.

E. Scope/Procedure

The scope of this procedure is to limit, prevent and remediate mold resulting from moisture infiltration in NIH buildings. To summarize, prevention is achieved by removal of moisture within the first 48 hours. Remediation is required when moisture is not removed with the first 48 hours.

E.1 Within the first 48 hours of water infiltration: If water is removed and materials are dried within the first 48 hours, then mold abatement is usually not necessary as a result of the moisture infiltration.

Step 1. The first step in moisture removal is to identify and remove the source of water infiltration. On the NIH campus, it is the responsibility of the occupant to notify the central call-in desk (at 301-435-8000) to correct and remove the source of water infiltration and to remove water. In addition, the occupant must also notify the Facility Manager of that building within 4 hours of the damage for guidance and assistance. In lease facility, the occupant must notify appropriate building personnel as specified in their lease.

Step 2. Once the source of water infiltration is corrected, then clean up needs to start immediately. Appendix A gives further guidance on how to remediate moisture in the first 48 hours to prevent mold growth.

E.2 Water Infiltration – after 48 hours or unknown duration: After 48 hours, mold growth is likely to have begun and mold abatement may be necessary as a result of the moisture infiltration.

Step1. Remove source of water infiltration (See Step 1 above). In addition, the Division of Occupational Health and Safety (DOHS), ORS (at 301-496-3353) must be contacted by the building occupant to evaluate and make recommendations. The building occupant is responsible for implementing DOHS's recommendations. Depending on the recommendations, other services may need to be procured in accordance with applicable procurement procedures. DOHS will define its role as part of the evaluation.

See Appendix B for further information on mold abatement. Appendix B is for information only and is not intended as a substitute for DOHS expertise.

If water infiltration necessitates the replacement of any portion of a gypsum shaft or partition assembly, or any interior wall, ceiling or floor finishes, the facility manager shall coordinate the repairs/replacement through the Division of the Fire Marshal, ORS. Specific materials and construction methods will be necessary to maintain any required fire protection ratings of partition and shaft assemblies. U.L. classified

wall, ceiling and floor finish materials may be required in accordance with the IBC, and NFPA 101 “Life Safety Code” or the NIH Design Policy and Guideline.

F. Relevant Documents

1. “Mold Remediation in Schools and Commercial Buildings”, Environmental Protection Agency, Office of Air and Radiation, Indoor Environments Division, EPA 402-K-01-001, March 2001.
2. “Molds in Indoor Workplaces”, Hazard Evaluation Systems and Information Service, California Department of Health Services, March 2001.
3. “Managing Water Infiltration into Buildings”, Department of Environmental Health and Safety, University of Minnesota.
4. “Guidelines on Assessment and Remediation of Fungi in Indoor Environments”, New York City Department of Health, June 2000.

G. Management Controls

1. Office Responsible for Review: Division of Occupational Health and Safety, ORS.
2. Frequency of Review: Whenever there are substantive changes or every three (3) years.

H. Contact Information

To obtain copies of this policy or for further information, contact the Office of Research Facilities, Division of Policy and Program Assessment (DPPA), Policy Branch, Phone 301-435-2047 or see the website: <https://orfnet.od.nih.gov/>

I. Appendices

1. Water Infiltration, within the first 24 to 48 Hours
2. Water Infiltration, Over 48 Hours

APPENDIX A

WITHIN THE FIRST 24 TO 48 HOURS of WATER INFILTRATION

In the event of water infiltration into building areas, the first 24 to 48 hours is critical.

Following discovery of water infiltration into building spaces, it is necessary to first identify the moisture source (clean or polluted water). If the water infiltrating the building is clean water (no chemical or biological pollutants or sewage), the sooner repair, clean up, and drying are accomplished, the greater the chances to prevent mold growth. If however, existing mold growth is found, mold remediation is necessary; proceed to Appendix B. If water is polluted, contact DOHS, ORS at 301-496-3353.

Potable, DI, RO and distilled water are considered to not be polluted unless they come in contact with a pollution source. All others are considered polluted.

The next step is to halt further moisture intrusion by repairing the defect and conduct an inventory of the water damaged areas, building materials, and furnishings, paying special attention to identifying wet carpet under cabinets, furniture, and furnishings. If it is impossible to determine how long the water infiltration has existed, it should be handled as if it has existed for more than 48 hours (proceed to Appendix B).

It is ultimately a judgment call when determining whether materials are “dry”. When in doubt, use a moisture meter to check drywall in an affected area and compare the reading to a control reading in a non-affected area. Readings should be the same.

Following are guidelines for the handling of water-damaged materials in order to prevent mold growth:

- A. Ceiling Tiles:** Discard and replace. If the tiles are glued onto the ceiling or wall, the DOHS, ORS should be contacted (at 496-3353). The DOHS will have the samples analyzed to determine whether the material(s) contain asbestos.
- B. Carpet and Backing:** Remove all furniture/cabinets sitting on wet carpet. Remove water with water extraction vacuum; reduce ambient humidity levels with de-humidifiers; and speed drying by using fans.
- C. Cellulose Insulation:** Discard and replace.
- D. Fiberglass Insulation:** Discard and replace.
- E. Electrical:** Consider all wet wiring, light fixtures, and electrical outlets to be shock hazards until checked by a building inspector or electrician. Turn power off in the area of the water leak until checked. All electrical circuit breakers, GFI's, and fuses that became wet need to be replaced. All electric motors, light fixtures, etc. that were wet must be opened, cleaned, and air-dried by a qualified person. Before placing the items back into service, they must be inspected to ensure that there are no visible moisture/water droplets.
- F. Books and Papers:** Non-valuable materials should be discarded. Photocopy valuable/important items and discard originals. For items with high monetary or

sentimental value, consult with a restoration/water damage specialist.

- G. Concrete or Cinder Block Surfaces:** Remove water with a water extraction vacuum. Speed drying with de-humidifiers, fans, and/or heaters.
- H. Hard Surfaces, Porous Flooring (Linoleum, Ceramic Tile, Vinyl):** Vacuum or damp wipe with water and mild detergent and allow drying. Check under flooring to make sure it is dry.
- I. Non-Porous, Hard Surfaces (Plastics, Metals):** Vacuum or damp wipe with water and mild detergent and allow drying.
- J. Upholstered Furniture:** Remove water with extraction vacuum. Accelerate drying with de-humidifiers, fans, and/or heaters. The drying of furniture may be difficult to complete within 48 hours. If piece is valuable, consult a restoration/water damage specialist.
- K. Wallboard (Drywall and Gypsum Board):** May be dried in place if there is no water stain and/or obvious swelling and the seams are intact. Remove base molding to inspect wallboard. If wallboard cannot be dried within the 48 hour time period, measure twelve (12) inches above water mark/damage, remove, and discard wallboard below the 12-inch mark. Remove and discard damp insulation and ventilate wall cavity. In some cases it may be difficult to tell if the wallboard has been sufficiently dried. A moisture meter can be used to check for moisture. To use a moisture meter, check the affected area and compare the reading to a control reading in a non-affected area.
- L. Wood Surfaces:** Remove moisture immediately and use de-humidifiers, gentle heat, and fans for drying. Use caution when applying heat to hardwood floors. Treated or finished wood surfaces may be cleaned with mild detergent and clean water and allowed to dry. Wet paneling should be pried away from the wall for drying.

APPENDIX B

WATER INFILTRATION OVER 48 HOURS

In the case where a water infiltration event has remained untreated after 48 hours, it is possible that mold growth has begun. There may be visible evidence of growth or a moldy, damp smell. In these cases, the situation is now one of potential mold remediation.

The Division of Occupational Health and Safety (DOHS), ORS must be contacted (at 301-496-3353) by the building occupant for evaluation and recommendation. Remediation efforts are more intensive and need to be designed to protect the health of building occupants and remediation personnel. Recommendations for cleanup or remediation by the DOHS, ORS will depend on the extent of the area of damage, type of material affected, and presence/type of mold growth. Recommendations will include determining whether current occupants should be relocated, containment/cleanup methods (including if remediation can be done by in-house personnel or if professionals are required), and personal protective equipment required by clean up crews.

Air handlers (AHUs) servicing the affected area(s) shall not be shut down unless gross, visible mold growth has been identified and a containment area cannot be established. A containment area will consist of covering the supply and return air openings with 6-mil thick plastic. Having the AHU running helps to expedite the drying process.

A. Water Stains: Water stains are commonly found in buildings throughout the NIH campus. The following procedures should be followed:

A.1 If the stain is dry and it is:

- **Carpet:** Have stain cleaned. If it goes away and then comes back, identify and eliminate the moisture infiltration source and replace the carpet.
- **Wallboard:** Use moisture meter to check for moisture behind wall. To use a moisture meter, check the affected area and compare the reading to a control reading in a non-affected area. If excessive moisture (higher than adjacent walls) is detected, replace wallboard. If no moisture detected, clean and paint.
- **Ceiling tile:** Discard and replace.

A.2 If it is still wet (48 hours) and it is:

- **Carpet or Wallboard:** Fix moisture problem, dry, and clean.
- **Ceiling tiles:** Discard and replace.

A.3 If it is still wet (unknown or past 48 hours) or apparent mold: Contact DOHS (496-3353).

B. Mechanical Rooms: Mechanical room leaks, standing water, consistent humidity levels above 60%, and condensation problems should be fixed as soon as they are detected. If standing water is found in areas that have concrete or tile floors and there is no apparent mold, the DOHS does not need to be contacted.

C. Contaminated Water: If the water infiltrating a building area is polluted, the DOHS should be contacted immediately. Potable, DI, RO and distilled water are considered to not be polluted unless they come in contact with a pollution source. All others are considered polluted. Following repairs to prevent any further infiltration, any contaminated ceiling tiles, carpet, upholstered furniture, paper products, etc. must be disposed in sealed containers by personnel wearing appropriate personal protective equipment (protective clothing, gloves, boots, and, at a minimum, a N-95 type respirator). The entire area will need to be disinfected.

D. Moisture Meters: A moisture meter may be useful in the following situations:

- D.1 When a dried stain has been found on wallboard and a decision must be made as to whether the stain can be cleaned or further action is required.
- D.2 Determining whether wallboard has been sufficiently dried during the 24-48 hour period. Sometimes it may be difficult to determine whether the wallboard has been completely dried. When in doubt, use a moisture meter to check drywall in an affected area and compare the reading to a control reading in a non-affected area. Readings should be the same.

E. Biocides: The goal of mold remediation is to remove the mold and prevent human exposure and damage to building materials and furnishings. Remediation should clean up mold contamination, not just kill it. Even after it is dead, the remaining mold fragments are still allergenic and some are potentially toxic. The use of biocides is not routinely recommended during remediation. However, there may be some instances where the use of a biocide may be justified (when immune compromised individuals are present). It is not possible to get rid of all mold spores in a building environment. Spores will be present but they will not grow if the moisture problem in the building is fixed.

If biocides are to be used, the area where they are used must be evacuated of area occupants and be properly ventilated. Biocides are toxic to humans as well as molds. Appropriate personal protective equipment must be worn. Since some biocides are registered with the EPA as pesticides, they may only be applied by licensed Federal or State Applicators.

F. Mold Sampling: In most cases, sampling for mold is unnecessary even if there are visible signs of mold or moldy, musty odors. In some specific instances such as where litigation is involved, the source of the mold is unclear, or health concerns are a problem, then sampling may be part of the site evaluation. Sampling for mold should only be done after a sampling strategy has been developed.

Since no EPA or other Federal Threshold limits have been set for mold or mold spores, sampling cannot be used to check a buildings' compliance with existing standards.